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# A study on distribution of causes of non-gestational AUB in reproductive age group as per the FIGO classification in a tertiary care centre

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**Abstract**
**Background:** Abnormal uterine bleeding is a common presenting complaints in the Gynaecology outpatient department in all age groups. Histopathological evaluation of the endometrial samples plays a significant role in the diagnosis of abnormal uterine bleeding. Endometrial tissue can be collected by sampling procedure such as Dilatation and Curettage (D&C), endometrial biopsy, pippelle aspiration or Hysteroscopy which is considered as gold standard. Variety of causes are there for AUB including causes which can be structural and can be imaged or non-structural which can be detected by history and laboratory tests. In this study an attempt is made to find out the causes and categorize them as per FIGO system.
**Aims and Objectives**
1. To find out the causes of AUB in the reproductive age group.
2. To categorize the causes of AUB as per the FIGO system.

**Methodology and outcome:** The study comprises 350 women of reproductive age group with AUB attending outpatient Gynae department of SMIMS, from Jun 2019 to Nov 2019. They were assessed on the basis of structured history, physical examination, local pelvic examination, investigations, USG and endometrial histopathology. Cause of AUB was detected and treatment was given to the patient as appropriated by categorization done in agreement with the palm-COEIN classification put forward by FIGO.
**Results:** The most prevalent cause of AUB was ovulatory dysfunction (n=99, 28.2%). Next common cause was leiomyoma (n=90, 25.7%), followed by endometrial causes (n=52, 14.5%), adenomyosis (n=30, 8.5%), not yet classified (n=32, 9.7%), Malignancy & Hyperplasia (n=28, 8.1%), Polyp (n=9, 2.5%), Iatrogenic (n=7, 2.2%) and Coagulopathy (n=1, 0.3%).
**Conclusion:** Ovulatory dysfunction and leiomyoma stands in front as the aetiological factors for AUB followed by endometrial causes and adenomyosis. The palm-COEIN classification helps to categorize the cause of AUB in a practical way thereby effectively direct the correct treatment for AUB patients. It helps in streamlining the investigations and management. Utilizing the advanced investigations, a better definition of the factors in palm COEIN can be done which will increase the pickup rate in various groups.

**Keywords:** Distribution, AUB, FIGO classification

## Introduction
Abnormal uterine bleeding (AUB) is a common problem among women in the reproductive age group. AUB may be accompanied by significant social embarrassment, and have a substantial effect on health-related quality of life. AUB leads to loss of productivity and may result in surgical interventions including hysterectomy. AUB can be acute or chronic. It affects 3-30% of the population. Chronic AUB is identified if the symptoms last for more than 6 months. Sometimes an acute episode of AUB can complicate chronic AUB. Because of versatile causes of AUB, FIGO put forward a system called palm COEIN classification to help the clinician for stream lining the investigations and interpreting the results and also to provide evidence based clinical care. Abnormal uterine bleeding can be due to causes which can be detected by clinical examination, imaging and histopathology and these comes under palm group otherwise called structural lesions. The causes which cannot be detected by imaging but can be detected by clinical history supported by laboratory investigations belongs to the COEIN group otherwise called as non-structural lesions. Patients on anticoagulant drugs and on hormones when they develop AUB, it should be considered as iatrogenic and N category is named as “not otherwise

classified" because later on they may go to some unique group by further investigations like histopathological study or imaging techniques. Dysfunctional uterine bleeding (DUB) is abnormal uterine bleeding that is exclusively due to HPO axis dysfunction. In this cross sectional study, an attempt is made to classify the AUB as per the etiology by clinical, laboratory, imaging, and histopathology and hysteroscopy examination

**Methods:** A cross sectional study was carried out in the Department of obstetrics and Gynaecology Sree Mookambika Institute of Medical Sciences Kulasekharan during the period from June 2019 to November 2019. The subject inclusion criteria are as follows:

1. Women aged 18 to 45 years
2. Chronic AUB

Including any of the following:
Menstrual cycle of <24 days; menstrual cycle of >38 days; irregularity of menses, cycle-to-cycle variation of >20 days during 12 months; duration of flow of >8 days; duration of flow of <4 days; flow volume as patient determined (light/normal/heavy).
The exclusion criteria are as follows

1. Vaginal bleeding caused by pregnancy and pregnancy-related factors.
2. Vaginal bleeding caused by vaginitis.
3. Vaginal bleeding caused by cervical diseases.

This study adopted a questionnaire investigation method, following the principle of informed consent. Patient information, such as age, height, weight, menstrual history, obstetric history, medical history, surgical history was taken. And the relevant clinical examination and laboratory test results, including routine blood test, hormonal assays, vaginal ultrasound, liver function, renal function, hysteroscopic examination, and histopathological report were obtained. At the same time, a lecture and training on AUB-related concepts were conducted, and a menstrual record paper was distributed to the patients to be kept as a menstrual diary for 3 months. The menstrual diary should record abnormal menstruation (e.g., menstrual period cycle and duration, volume of monthly blood loss). After 3 months, the main causes of AUB were determined according to the medical history and physical and auxiliary examination results.

## Results

**Table 1:** Age distribution of study population

| Age group | Total number | Percentage |
|---|---|---|
| 18-20 years | 5 | 01.4% |
| 21-30 years | 15 | 04.2% |
| 31-40 years | 131 | 37.4% |
| 41-45 years | 167 | 47.7% |

**Table 2:** Distribution of study population based on presented complaints.

| Symptom (complaints) | Total number | Percentage |
|---|---|---|
| Heavy Menstrual Bleeding | 131 | 37.4% |
| Irregular Heavy Bleeding | 95 | 27.0% |
| Intermenstrual Bleeding | 7 | 02.0% |
| Frequent Bleeding | 77 | 22.0% |
| Post-Menopausal Bleeding | 28 | 08.0% |
| Infrequent or Scanty Bleeding | 12 | 03.4% |

All the 350 women studied were placed in the nine categories of palm-COEIN classification. Maximum patients, 47.7%, were in the age group of 40-50 years and 37.4% were in the 30-40 years age group. Majority of patients, 37.4%, complained of heavy bleeding as chief complaint. 27% had irregular heavy bleeding and 22% had frequent bleeding. As per the palm-COEIN classification, Leiomyoma was the most common in the palm group and ovulatory dysfunction was the most prevalent cause of AUB in the COEIN group. Simple ovarian cysts and PCOS were common sonographic findings. Hypothyroidism was also noted. Next common category was Leiomyoma AUB L(n=90, 25.7%), followed by Endometrial AUB-E causes (n=52, 14.5%), adenomyosis AUB-A (n=30, 8.5%), Malignancy AUB-M (n=28, 8.1%), Not classified AUB-N (n=32, 9.7%), Polyp AUB-P (n=9, 2.5%), iatrogenic AUB-I (n=7, 2.2%) and coagulopathy AUBC (n=1, 0.3%)

**Table 3:** Distribution of study population according to palm-COEIN classification (total 350 patients)

| Causes | | Total Number | Percentage |
|---|---|---|---|
| Structural | Polyp (AUB-P) | 9 | 2.5% |
| | Adenomyosis (AUB-A) | 30 | 8.5% |
| | Leiomyoma (AUB-L) | 90 | 25.7% |
| | Malignancy (AUB-M) | 28 | 8.1% |
| Non-structural | Coagulopathy (AUB-C) | 1 | 0.3% |
| | Ovulatory Dysfunction (AUB-O) | 99 | 28.2% |
| | Endometrial (AUB-E) | 52 | 14.5% |
| | Iatrogenic (AUB-I) | 7 | 2.2% |
| | Not yet classified (AUB-N) | 32 | 9.7% |

## Discussion

In this study the most common cause for AUB is Ovulatory dysfunction followed by leiomyoma as mentioned in other studies. The incidence of endometritis and endometrial malignancy were relatively high compared to other study. Adenomyosis were relatively less.
Some patient had more than 1 lesion but the main contributory lesion for her symptoms is taken for categorization. The conduct this study was to find out the causes of AUB and to test the efficiency and practicality of palm-COEIN classification system in clinical practice in determining the cause of disease and treatment modality for patient with AUB. The new FIGO classification was developed to clear long standing confusions regarding terminologies and definitions related to AUB. This study focuses to categorize the patient of AUB as per the PALM-COEIN classification and is similar to studies by Khrouf *et al*. [8] Munro *et al*. [6] Madhra *et al*. [9] Bahamondes and Ali [10]. In present study, most of the patients presented with AUB were in age group 40-45 years (47.7%) and 30-40 years (37.4%). Regarding presenting symptoms heavy menstrual bleeding (37.4%) was the most common, followed by irregular heavy bleeding and frequent bleeding 27% and 22% respectively. It

was also noted that infrequent and scanty bleeding was more common in obese and PCOS women. According to study done by Gouri *et al*. [11] in May, 16, most patients belongs to ovulatory dysfunction (27%), followed by leiomyoma (24.7%). In study done by Goel P *et al*. [12], ovulatory dysfunction was found to be the most common cause of AUB (28.3%) followed by leiomyoma (22.7%). In present study also ovulatory dysfunction was found to be the most common cause of AUB (28.2%) (Table 4). PCOS, hormonal dysfunction, thyroid dysfunction, simple ovarian cyst were included in this category. In study done by Qureshi and Yusuf [13] in 2013, leiomyoma was most common category (25%) followed by ovulatory dysfunction (24%). In study for Ratnani R *et al* [14] in Sep'17, leiomyoma (35%) was the most common cause of AUB, followed by malignancy and hyperplasia, adenomyosis and ovulatory dysfunction. In present study, leiomyoma was found in 25.7% of women and endometrial category was in 14.5% patients. In study done by Gouri *et al*. and Goel P *et al*, endometrial causes were found on 9% and 20.7% respectively. This study encapsulates the ease of use and implementation of this classification system. Moreover, treatment of pathology was easier where the cause of AUB was determined. In present study, we could understand the major causes of AUB and they can be grouped into structural and non-structural cause. In both management plans were different, hence management was more focused and tailored to specific cause. The major disadvantage was in cases of patients who belonged to AUB-N category to whom treatment is vague in absence of diagnosis. Also, COEIN part of classification needs further improvement through elaborate research. Further sub classification and screening by MRI scan, coagulative studies, ovulatory function study can give a better picture regarding diagnosis. In our study it is found that cause can be one or more and considerable overlapping is present. But endometritis and malignancy was slightly high. The mapping of fibroid can be improved by doing MRI scan and 3D scan. Adenomyosis can be picked up in a better way by high resolution TVS. Caesarean section leading to AUB due to the development of isthmocele was present in other studies but not picked up in this study.

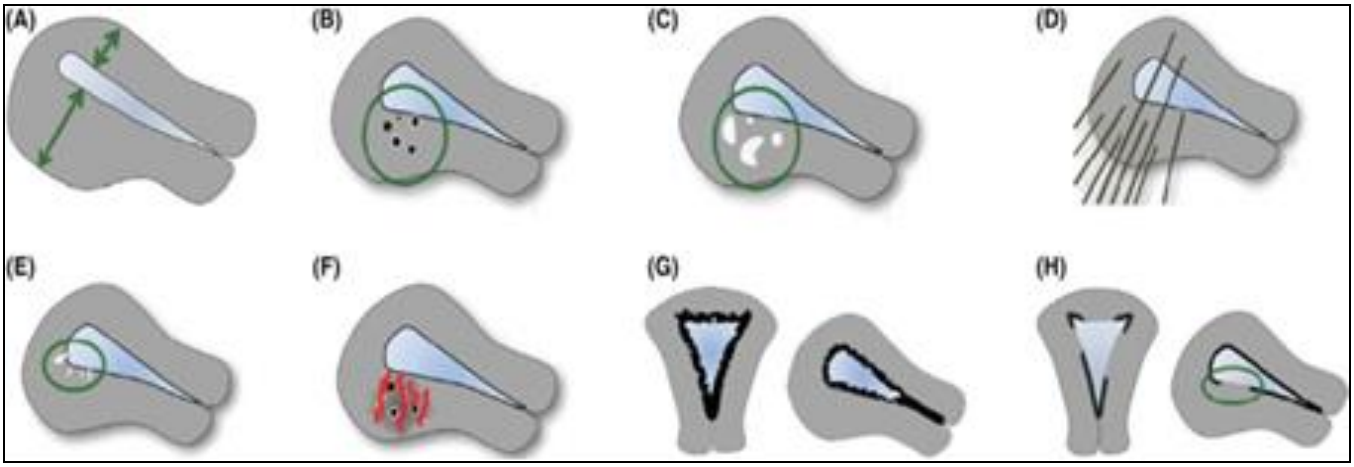


**Fig 1:** Adenomyosis diagnostic criteria. Graphic depictions of the eight TVUS criteria proposed by the MUSA group are presented

Adenomyosis diagnostic criteria. Graphic depictions of the eight TVUS criteria proposed by the MUSA group are presented. These include myometrial thickening

a. Myometrial cysts
b. Hyperechoic islands
c. Fan shaped shadowing
d. Echogenic subendometrial lines and buds
e. Translesional vascularity
f. Irregular Junctional zone
g. An interrupted Junctional zone
h. Identification and evaluation

Of the Junctional zone may best be accomplished with three-dimensional ultrasonography. For the present at least, the presence of two or more of these criteria are highly associated with a diagnosis of adenomyosis.

**Table 4:** Comparison of distribution of causes

| | | Number of patients (%) | | | | |
|---|---|---|---|---|---|---|
| **Causes** | **Category** | **Present study** | **Gouri *et al*.** | **Goel *et al*.** | **Qureshi & yusuf** | **Ratnani *et al*.** |
| Polyp | P | 09(02.5%) | 06(02.0%) | 08(02.7%) | 30(03.0%) | 40(13.3%) |
| Adenomyosis | A | 30(08.5%) | 38(12.7%) | 28(09.3%) | 150(15%) | 60(20.0%) |
| Leiomyoma | L | 90(25.7%) | 74(24.7%) | 68(22.7%) | 250(25%) | 105(35%) |
| Malignancy or hyperplasia | M | 28(08.1%) | 15(05.0%) | 08(02.7%) | 66(06.7%) | 65(21.6%) |
| Coagulopathy | C | 01(00.3%) | 09(03.0%) | 03(01.0%) | 03(03.0%) | 02(00.6%) |
| Ovulatory Dysfunction | O | 99(28.2%) | 81(27.0%) | 85(28.3%) | 236(24%) | 60(20.0%) |
| Endometrial | E | 52(14.5%) | 27(09.0%) | 62(20.7%) | 48(05.0%) | 12(04.0%) |
| Iatrogenic | I | 07(02.2%) | 24(08.0%) | 13(04.3%) | 53(06.0%) | 03(01.0) |
| Not yet classified | N | 32(09.7%) | 19(6.3%) | 25(08.3%) | 155(15%) | 03(01.0%) |

**Table 5:** Palm-COEIN classification for the etiologies of abnormal uterine bleeding proposed by the International Federation of Gynaecology and Obstetrics (FIGO)

| AUB causes | Subclass | Characteristics |
|---|---|---|
| Structural causes | Polyps | ¬ Present in endometrial and endocervical canal |
| | (AUB-P) | ¬ Categorized as absent or present |
| Adenoma (AUB-A) | ¬ The genesis is controversial but minimal criterion is identification on ultrasound testing. | |
| Leiomyoma (AUB-L) | 0: Submucosal types, do not impact endometrial cavity<br>Othres:<br>1: < 50% Intramural<br>2: ≥50% Intramural<br>3: Totally extracavitary but lean on the endometrium, 100% intramural<br>4: Intramural leiomyomas that are entirely within the myometrium<br>5: Subserosal and at least 50% intramural | 6: Subserosal and < 50% intramural<br>7: Subserosal and attached to serosa by stalk<br>8: Do not involve the myometrium include cervical lesions, lesions that exist in the round or broad ligaments without direct attachment to the uterus, and parasitic lesions |
| Malignancy & hyperplasia (AUB-M) | ¬ May occur because of ovulatory disorder<br>¬ Sub-classification according to the WHO or FIGO system. | |
| Non-structural causes | Coagulopathy (AUB-C) | ¬ Coagulopathy represents both inherited and acquired<br>¬ Most common is inherited von Willebrand disease |
| Ovulatory dysfunction (AUB-O) | ¬ Can lead to amenorrhea or heavy menstrual bleeding. | |
| Endometrial (AUB-E) | ¬ Likely to occur when other abnormalities are excluded in the presence of normal ovulatory function. | |
| Iatrogenic (AUB-I) | ¬ Breakthrough bleeding during use of single or combined gonadal steroid therapy, intrauterine systems, or devices, systemic agents that interfere with dopamine metabolism, or anticoagulant drugs. | |
| Not classified (AUB-N) | ¬ Rare or ill-defined conditions: Chronic endometritis, arteriovenous malformations, and myometrial hypertrophy | |

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